selecting a GPS measurement among the plurality of GPS measurements as the faulty measurement based on the correlation values.

2. (Previously presented) The method of claim 1 wherein the correlation values represent a correlation between residuals of the plurality of measurements and residuals corresponding to a change in one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

3. (Currently amended) ~~The method of claim 1 wherein computing the correlation values comprises:~~

A method for identifying a faulty measurement among a plurality of measurements that are used to determine a state of a discrete-time controlled process, comprising:

computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements; the computing of the correlation values including:

computing a residual sensitivity matrix;

computing residuals corresponding to the plurality of measurements; and

computing a correlation coefficient associated with the one of the plurality of measurements based on the residuals of the plurality of measurements and the residual sensitivity matrix~~.~~; and

selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values.

4. (Original) The method of claim 3 wherein computing the residuals corresponding to the plurality of measurements comprises:

obtaining a least-squares solution of the state of the discrete-time controlled process;

computing expected values of the plurality of measurements based on the least-square solution; and

computing differences between the plurality of measurements and the expected values of the plurality of measurements.

5. (Original) The method of claim 3 wherein the residuals corresponding to the plurality of measurements are computed using the residual sensitivity matrix.

6. (Previously presented) The method of claim 1 wherein selecting a measurement among the plurality of measurements as the faulty measurement comprises:

identifying a highest correlation value; and

selecting a measurement associated with the highest correlation value as the faulty measurement.

7. (Original) The method of claim 6, wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

identifying a second highest correlation value; and

selecting the measurement associated with the highest correlation value as the faulty measurement when the difference between the highest correlation value and the second highest correlation value exceeds a predetermined threshold value.

8. (Previously presented) The method of claim 6 wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

determining that the highest correlation value exceeds a first predetermined threshold value;

identifying a second highest correlation value; and

determining that the second highest correlation value is smaller than the first predetermined threshold value and the difference between the first predetermined threshold value and the second highest correlation value exceeds a second predetermined threshold value.

9. (Cancelled)

10. (Currently amended) The method of claim ~~9~~ 1 wherein the number of the plurality of satellites is greater than 5.

11. (Original) The method of claim 1, further comprising:

determining a size of an error in the faulty measurement.

12. (Original) The method of claim 11 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a root mean square residual corresponding to a unit change in the one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

13. (Previously presented) The method of claim 11 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a square root of a diagonal element corresponding to the faulty measurement in a residual sensitivity matrix.

14. (Previously presented) A method for detecting and identifying a faulty measurement among a plurality of GPS measurements obtained by a GPS receiver with respect to a plurality of satellites, comprising:

determining whether the plurality of GPS measurements include a faulty measurement; and

in response to a determination that the plurality of GPS measurements include a faulty measurement, identifying a satellite contributing the faulty measurement by:

computing a plurality of correlation values, each correlation value associated with one of the plurality of satellites; and

selecting a satellite among the plurality of satellites as the satellite contributing the faulty measurement based on the correlation values.

15. (Original) The method of claim 14 wherein determining whether the GPS measurements include a faulty measurement comprises:

computing a test statistic using post-fix residuals corresponding to the plurality of GPS measurements; and

determining whether the test statistic exceeds a fault threshold.

16. (Original) The method of claim 15 wherein the fault threshold is a function of a navigation mode used by the GPS receiver.

17. (Currently Amended) The method of claim 15, further comprising:

determining a size of an error in the faulty ~~GPS~~ measurement.

18. (Original) The method of claim 17, further comprising:

verifying that the satellite contributing to the faulty measurement has been correctly identified.

19. (Currently Amended) The method of claim 18 wherein verifying that the satellite contributing to the faulty measurement has been correctly identified comprises:

adjusting the post-fix residuals based on the size of the error in the faulty ~~GPS~~ measurement;

computing the test statistic using the adjusted post-fix residuals; and

verifying that the test statistic does not exceed the fault threshold.

20. (Previously presented) The method of claim 14 wherein computing the correlation value associated with a respective satellite comprises:

computing a residual sensitivity matrix;

computing residuals corresponding to the plurality of GPS measurements; and

computing a correlation coefficient associated with the respective satellite based on the residuals and the residual sensitivity matrix.

21. (Original) The method of claim 14 wherein selecting a satellite among the plurality of satellites as the satellite contributing the faulty measurement comprises:

identifying a highest correlation value; and

selecting the satellite associated with the highest correlation value as the satellite contributing the faulty measurement.

22. (Currently amended) A computer readable medium comprising computer executable program instructions that when executed by a processor in a digital processing system, causes the digital processing system to perform the operations of:

computing a plurality of correlation values, each correlation value associated with one of the plurality of GPS range measurements obtained by a GPS receiver with respect to a plurality of satellites, each of the plurality of GPS measurements corresponding to one of the plurality of satellites; and

selecting the GPS range measurement associated with a highest correlation value among the plurality of correlation values as ~~the~~ a faulty measurement.

23. (Original) The computer readable medium of claim 22 wherein the method further comprises:

determining a size of an error in the faulty measurement.

24. (Currently amended) A computer-readable medium containing thereon instructions, which, when executed by a processor in a digital processing system, causes the digital processing system to determine a state of a discrete-time controlled process by performing the operations of:

computing a plurality of correlation values, each correlation value associated with one of ~~the~~ a plurality of GPS range measurements obtained by a GPS receiver with respect to a

plurality of satellites, each of the plurality of GPS measurements corresponding to one of the plurality of satellites; and

selecting a GPS measurement among the plurality of GPS measurements as ~~the~~ a faulty measurement based on the correlation values.

25. (Previously presented) The computer-readable medium of claim 24 wherein the operations that the instructions cause the digital processing system to perform further comprise:

determining a size of an error in the faulty measurement.

26. (Previously presented) The computer-readable medium of claim 25 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a root mean square residual corresponding to a unit change in one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

27. (Previously presented) The computer-readable medium of claim 25 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a square root of a diagonal element corresponding to the faulty measurement in a residual sensitivity matrix.

28. (Previously presented) The computer readable medium of claim 24 wherein the correlation values represent a correlation between residuals of the plurality of measurements and residuals corresponding to a change in the one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

29. (Currently amended) ~~The computer-readable medium of claim 24 wherein computing the correlation values comprises:~~

A computer-readable medium containing thereon instructions, which, when executed by a processor in a digital processing system, causes the digital processing system to determine a state of a discrete-time controlled process by performing the operations of:

computing a plurality of correlation values, each correlation value associated with one of ~~the~~ a plurality of measurements, the computing of the correlation values including:

computing a residual sensitivity matrix;

computing residuals corresponding to the plurality of measurements; and

computing a correlation coefficient associated with the one of the plurality of measurements based on the residuals of the plurality of measurements and the residual sensitivity matrix~~.~~; and

selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values.

30. (Previously presented) The computer-readable medium of claim 29 wherein computing the residuals corresponding to the plurality of measurements comprises:

obtaining a least-squares solution of a state of a discrete-time controlled process;

computing expected values of the plurality of measurements based on the least-square solution; and

computing differences between the plurality of measurements and the expected values of the plurality of measurements.

31. (Previously presented) The computer-readable medium of claim 29 wherein the residuals corresponding to the plurality of measurements are computed using the residual sensitivity matrix.

32. (Previously presented) The computer-readable medium of claim 24 wherein selecting a measurement among the plurality of measurements as the faulty measurement comprises:

identifying a highest correlation value; and

selecting the measurement associated with the highest correlation value as the faulty measurement.

33. (Previously presented) The computer-readable medium of claim 32, wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

identifying a second highest correlation value; and

selecting the measurement associated with the highest correlation value as the faulty measurement when the difference between the highest correlation value and the second highest correlation value exceeds a predetermined threshold value.

34. (Previously presented) The computer-readable medium of claim 32 wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

determining that the highest correlation value exceeds a first predetermined threshold value;

identifying a second highest correlation value; and

determining that the second highest correlation value is smaller than the first predetermined threshold value and the difference between the first predetermined threshold value and the second highest correlation value exceeds a second predetermined threshold value.

35. (Cancelled)

36. (Currently amended) The computer-readable medium of claim ~~35~~ 24 wherein the number of the plurality of satellites is greater than 5.

37. (Currently amended) A system capable of identifying a faulty measurement among a plurality of GPS range measurements that are used to determine a state of a discrete-time controlled process, comprising:

a processor;

a memory including instructions, which, when executed by the processor, causes the processor to perform the operations of:

computing a plurality of correlation values, each correlation value associated with one of the plurality of GPS measurements obtained by a GPS receiver with respect to a plurality of satellites, each of the plurality of GPS measurements corresponding to one of the plurality of satellites; and

selecting a GPS measurement among the plurality of GPS measurements as the faulty measurement based on the correlation values.

38. (Previously presented) The system of claim 37 wherein the correlation values represent a correlation between residuals of the plurality of measurements and residuals corresponding to a change in the one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

39. (Currently amended) ~~The system of claim 37 wherein computing the correlation values comprises:~~

A system capable of identifying a faulty measurement among a plurality of measurements that are used to determine a state of a discrete-time controlled process, comprising:

a processor;

a memory including instructions, which, when executed by the processor, causes the processor to perform the operations of:

computing a plurality of correlation values, each correlation value associated with one of the plurality of measurements, the computing of the correlation values including:

computing a residual sensitivity matrix;

computing residuals corresponding to the plurality of measurements; and

computing a correlation coefficient associated with the one of the plurality of measurements based on the residuals of the plurality of measurements and the residual sensitivity matrix.; and

selecting a measurement among the plurality of measurements as the faulty measurement based on the correlation values.

40. (Previously presented) The system of claim 39 wherein computing the residuals corresponding to the plurality of measurements comprises:

obtaining a least-squares solution of the state of the discrete-time controlled process;

computing expected values of the plurality of measurements based on the least-square solution; and

computing differences between the plurality of measurements and the expected values of the plurality of measurements.

41. (Previously presented) The system of claim 39 wherein the residuals corresponding to the plurality of measurements are computed using the residual sensitivity matrix.

42. (Previously presented) The system of claim 37 wherein selecting a measurement among the plurality of measurements as the faulty measurement comprises:

identifying a highest correlation value; and

selecting the measurement associated with the highest correlation value as the faulty measurement.

43. (Previously presented) The system of claim 42, wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

identifying a second highest correlation value; and

selecting the measurement associated with the highest correlation value as the faulty measurement when the difference between the highest correlation value and the second highest correlation value exceeds a predetermined threshold value.

44. (Previously presented) The system of claim 42 wherein selecting the measurement associated with the highest correlation value as the faulty measurement comprises:

determining that the highest correlation value exceeds a first predetermined threshold value;

identifying a second highest correlation value; and

determining that the second highest correlation value is smaller than the first predetermined threshold value and the difference between the first predetermined threshold value and the second highest correlation value exceeds a second predetermined threshold value.

45. (Cancelled).

46. (Currently amended) The system of claim ~~45~~ 37 wherein the number of the plurality of satellites is greater than 5.

47. (Previously presented) The system of claim 37, wherein the operations further comprise:

determining a size of an error in the faulty measurement.

48. (Previously presented) The system of claim 47 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a root mean square residual corresponding to a unit change in one of the plurality of measurements while the rest of the plurality of measurements are unchanged.

49. (Previously presented) The system of claim 47 wherein determining the size of the error in the faulty measurement comprises:

dividing a root mean square residual of the plurality of measurements by a square root of a diagonal element corresponding to the faulty measurement in a residual sensitivity matrix.

50. (Currently amended) A system for identifying a faulty measurement among a plurality of GPS range measurements that are used to determine a state of a discrete-time controlled process, comprising:

means for computing a plurality of correlation values, each correlation value associated with one of the plurality of GPS measurements obtained by a GPS receiver means with respect to a plurality of satellites, each of the plurality of GPS measurements corresponding to one of the plurality of satellites; and

means for selecting a GPS measurement among the plurality of GPS measurements as the faulty measurement based on the correlation values.